

## **Committee on WIPO Standards (CWS)**

**Ninth Session**  
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### **PROPOSAL FOR A NEW STANDARD ON 3D DIGITAL OBJECTS**

*Document prepared by the 3D Task Force Leader*

#### **INTRODUCTION**

1. At its eighth session in 2020, the Committee on WIPO Standards (CWS) noted the progress of the 3D Task Force on Task No. 61: “Prepare a proposal for recommendations on digital three-dimensional (3D) models and images, including methods of search for 3D models and 3D images”. The CWS also noted the preliminary draft Standard that was included in the Task Force report. (See paragraph 73 to 75 and 103 to 108 of document CWS/8/24.)

#### **PROPOSED NEW WIPO STANDARD**

2. The Task Force prepared a final draft for a new proposed WIPO Standard “Recommendations on digital three-dimensional (3D) models and 3D images”. Major topics of discussion included the selection of file formats for different types of IP applications, necessary file sizes, providing two-dimensional (2D) views, publication requirements, and partial claiming.

3. The proposed Standard provides recommendations on how to store, process, exchange and disseminate IP data using digital 3D models and 3D images for intellectual Property Rights (IPRs). The proposal is presented in the Annex of the current document. The material includes recommendations for digital 3D models and 3D images formats and file size, procedural recommendations for filing and processing of 3D models and 3D images, recommendations for data exchange and publication, and recommendations for partial claiming.

4. The general recommendations section provides background information and common guidelines for IP Offices to process, exchange and publish data with 3D visual representations of objects in applications for IPR protection filed by applicants, according to each IPO's requirements.

5. The section on recommendations for digital 3D model and 3D image formats was drafted, by taking into account the results of two surveys carried out by the Task Force among IPOs, with input from some industries that use 3D as visual representations in IP applications. Following the discussions, the Task Force worked out a set of criteria for selecting 3D formats with recommendations based on surveys, the criteria, and best practices of IPOs and industry. The proposed preferred formats are modern, standardized, widely supported, open, and cross-platform, as well as addressing different needs of applicants and IPOs, and meeting the criteria agreed by the Task Force Members. The Task Force recommends the following formats for different IPRs:

- for inventions and utility models, it is recommended to use STEP, IGES, U3D, OBJ or STL with the maximum file size of 50 MB;
- for inventions related to chemical structures, it is recommended to use CDX or MOL;
- for industrial designs, it is recommended to use STEP, IGES, U3D, OBJ or STL with the maximum file size of 50 MB;
- for trademarks, it is recommended to use STEP, IGES, U3D, OBJ or STL with the maximum file size of 50 MB; and
- for integrated circuit topographies, it is recommended to use STEP, IGES, U3D, OBJ or STL with the maximum file size of 50 MB.

6. The section on procedural recommendations for filing and processing of 3D models and 3D images covers issues related to conversion and processing of filed 3D visual representations. Taking into account the results of the surveys identifying best practices for processing 3D visual representations, it is recommended to provide a certain number of 2D views of a 3D model or 3D image to perform examination procedures, according to the practices and requirements established by IPOs.

7. The section on recommendations for data exchange provides guidelines to establish the exchange of IP data containing 3D visual representations of objects for IPR protection in a harmonized manner, including preferred file formats and file size limitations. The section on recommendations for publication provides guidelines for both electronic and paper publications of the information related to IPRs.

8. Following discussions by the Task Force, it should be noted that the work on 3D search methods will be continued in calendar years 2021 – 2022. After finalizing the study, the Task Force intends to update the proposed Standard (if adopted at this session of CWS) and include recommendations on methods of search for 3D models and 3D images.

9. The Task Force, in consultation with the International Bureau, recommends the new Standard be designated as ST.91 with the title "Recommendations on digital three-dimensional (3D) models and 3D images" since it covers several types of IP: patents, trademarks and designs. The 90's range of WIPO Standards holds Standards that cover multiple types of IP, namely ST.96 for XML and ST.90 for web APIs.

TASK UPDATE

10. If the proposed Standard is adopted, the Task Force proposes updating the description of Task No. 61 as follows:

~~Prepare a proposal for recommendations on digital three-dimensional (3D) models and images~~ Ensure the necessary revisions and updates of WIPO Standard ST.91, including methods of search for 3D models and 3D images.

11. *The CWS is invited to:*

*(a) note the content of this document;*

*(b) consider and approve the proposed name of new WIPO Standard ST.91: "Recommendations on digital three-dimensional (3D) models and 3D images" as indicated in paragraph 9 above;*

*(c) consider and adopt the proposed new WIPO Standard ST.91, as reproduced in the Annex to this document; and*

*(d) consider and approve the revision of Task No. 61, as indicated in paragraph 10 above.*

[Annex follows]

## STANDARD ST. XX

### RECOMMENDATIONS ON DIGITAL THREE-DIMENSIONAL (3D) MODELS AND 3D IMAGES

Proposal presented by the 3D Task Force for consideration at CWS/9.

#### INTRODUCTION

1. This Standard provides recommendations for Intellectual Property Offices (IPOs) and other interested parties that manage, store, process, exchange or disseminate IP data using 3D models and 3D images.
2. This Standard has the following objectives:
  - (a) determination of formats that are available, compatible or interoperable with different software used by applicants in order to facilitate their efforts to prepare application materials before filing;
  - (b) reducing the time of IP application processing by IPOs;
  - (c) facilitating IP application filing to different IPOs due to adoption of recommended formats among IPOs;
  - (d) harmonization of requirements for data exchange on subjects for IP rights protection with digital 3D visual representations among IPOs and other organizations; and
  - (e) set of requirements for the publication of information on subjects for IP rights protection with digital 3D visual representations.

#### DEFINITIONS

3. For the purposes of this Standard, unless otherwise specified:
  - (a) 3D model – An electronic file that is created by specialized software, for mathematically representing the surface of an object's visual representation in three dimensions;
  - (b) 3D Images – Digital images that represent objects displayed in three dimensions such as 3D photos and stereoscopy;
  - (c) CAD – computer aided design;
  - (d) 3D PDF – a PDF document that contains 3D models;
  - (e) IGES – Initial Graphics Exchange Specification;
  - (f) OBJ – An open geometry vertex file format used for CAD and 3D printing;
  - (g) MOL – A text-based chemical file format that describes molecules and chemical reactions;
  - (h) PDF – The Portable Document Format is a file format developed by Adobe;
  - (i) 3DS – A file format used by the Autodesk 3ds Max 3D modeling, animation and rendering software;
  - (j) DWF – Design Web Format;
  - (k) DWG – A file format widely used for CAD drawings;
  - (l) Raster image – An image that is composed of a map of points (pixels), referred to as a bitmap. Typical file formats for raster images include JPEG, TIFF, PNG and BMP;
  - (m) STL – Standard Tessellation Language – a file format native to the stereolithography CAD software created by 3D Systems;
  - (n) STEP – Standard for the Exchange of Product model data – an open ISO Standard which can represent 3D objects in Computer-aided design (CAD) and related information;

- (o) U3D – Universal 3D (U3D) is a compressed file format standard for 3D computer graphics data;
- (p) Vector graphics – An image file that is composed of shapes formed of mathematical formulas and coordinates on a 2D plane. As opposed to raster images, vector graphics have the property of scaling infinitely without any degradation of quality; and
- (q) X3D – Successor of VRML, an Open ISO Standard XML format.

#### REFERENCES

4. The following WIPO Standards and other documents are relevant to the present Standard:

WIPO Standard ST.9	Bibliographic data on and relating to patents and SPCs
WIPO Standard ST.10	Published patent documents
WIPO Standard ST.60	Bibliographic data relating to marks
WIPO Standard ST.63	Content and layout of trademark gazettes
WIPO Standard ST.80	Bibliographic data relating to industrial designs
WIPO Standard ST.81	Content and layout of industrial designs gazettes
WIPO Standard ST.96	Processing of Industrial Property information using XML
ISO Standard 10303	Product data representation and exchange standard

#### GENERAL RECOMMENDATIONS

5. An application for IP protection may contain a 3D visual representation of an object in the form of a digital 3D model or 3D image in accordance with the requirements of the IPO receiving the application. Applicants can be encouraged to provide a 3D visual representation of the object as supplementary material to the application or as the main visual representation of the object, if specified by the requirements of the receiving IPO.

6. Formats and other characteristics of the received image files (e.g., file size) accepted by each IPO should be according to the recommendations of this Standard.

7. If an IPO has previously established its preferred image formats and other characteristics, it is recommended that the IPO announce in its official publications at regular intervals and/or on its websites, the image formats, sizes and other specific characteristics that are acceptable in application filings.

#### RECOMMENDATIONS FOR 3D MODELS AND 3D IMAGES FORMATS AND FILE SIZE

8. The following recommendations apply to providing application materials for the indicated type of IP rights.

##### Patent for invention or utility model

9. 3D visual representation of an invention or utility model should preferably be formatted as STEP, IGES, U3D, OBJ or STL. Maximum file size should not exceed 50 MB. If required, at an applicant's request the receiving IPO can accept files larger than the said maximum.

10. For chemical structures that are included in patent applications, 3D visual representation should preferably be formatted as CDX or MOL. Maximum file size should not exceed 50 MB.

##### Industrial design

11. 3D visual representation of an industrial design should preferably be formatted as STEP, IGES, U3D, OBJ or STL. Maximum file size should not exceed 50 MB. If required, at an applicant's request the receiving IPO can accept files larger than the said maximum.

##### Trademark

12. 3D visual representation of a trademark should preferably be formatted as STEP, IGES, U3D, OBJ or STL. Maximum file size should not exceed 50 MB. If required, at an applicant's request the receiving IPO can accept files larger than the said maximum.

##### Integrated circuit topography

13. 3D visual representation of an integrated circuit topography should preferably be formatted as STEP, IGES, U3D, OBJ or STL. Maximum file size should not exceed 50 MB. If required, at an applicant's request the receiving IPO can accept files larger than the said maximum.

#### PROCEDURAL RECOMMENDATIONS FOR FILING AND PROCESSING OF 3D MODELS AND 3D IMAGES

14. If an IPO converts a 3D model or 3D image from formats originally submitted by applicants to formats other than recommended above, or transforms from one storage format to another (e.g. STEP to STL), it is recommended that the IPO retain the original format as well as the transformed format for archival purposes.

15. If an IPO receives a 3D model as the only visual representation of an object in an application for IP right protection, it is recommended to make 2D views of the model in order to ensure compatibility with systems and processes where only 2D images of objects are accepted.

- (a) For patent applications for inventions or utility models, it is recommended to make seven 2D views of the 3D model, i.e., front, rear, right, left, top, bottom, and perspective views, in an electronic format corresponding to the requirements established by the IPO for 2D images of inventions or utility models.
- (b) For industrial design applications, it is recommended to make six 2D views of the 3D model, i.e., front, back, left, right, top, and bottom views, in an electronic format corresponding to the requirements established by the IPO for 2D images of industrial designs.
- (c) For trademark applications, it is recommended to make one 2D view of the 3D model, i.e., front view, in an electronic format corresponding to the requirements established by the IPO for 2D images of figurative trademarks.

16. It is recommended that an IPO define a set of guidelines and procedures for converting models and images from 3D to 2D formats.

#### RECOMMENDATIONS FOR DATA EXCHANGE

17. When IPOs exchange 3D model and/or 3D image data, file formats can be converted from the original formats, if such is established by an IPO. The conversion or transformation from the original file formats should be conducted in accordance with the guidelines and procedures established by the IPOs involved. The following additional requirements are recommended when exchanging application data for the indicated type of IP rights.

##### Patents for inventions or utility models

18. It is recommended that IPOs and other organizations comply with the following requirements when exchanging 3D models and/or 3D images data incorporated in patent documents:

- File formats: U3D, OBJ or STL, STEP, IGES; and
- Maximum file size: 50 MB.

19. For the chemical structures in the patent application, it is recommended that IPOs and other organizations comply with the following requirements when exchanging 3D models and/or 3D images:

- File format: MOL, CDX

##### Industrial designs

20. It is recommended that IPOs and other organizations comply with the following requirements when exchanging 3D models and/or 3D images incorporated in industrial design applications:

- File formats: U3D, OBJ or STL, STEP, IGES; and
- Maximum file size: 50 MB.

##### Trademarks

21. It is recommended that IPOs and other organizations comply with the following requirements when exchanging 3D models and/or 3D images incorporated in trademark applications:

- File formats: U3D, OBJ or STL, STEP, IGES; and
- Maximum file size: 50 MB.

#### RECOMMENDATIONS FOR ELECTRONIC PUBLICATION AND ONLINE DISPLAY

22. It is recommended that an electronic publication of an object in an IP application or IP right include 3D model and/or 3D image files received by the IPO in the list of published documents relating to the IP application or IP right.

23. Formats of published 3D files can be converted from the original formats, if desired by the IPO. Any conversions or transformations should be conducted in accordance with the guidelines and procedures established by the IPO.

24. For online display of 3D visual representation of an object, the following requirements are recommended:

- File formats: OBJ or STL; and
- Maximum file size: 50 MB.

25. For electronic publication of 3D visual representations of an object in PDF format, it is recommended to create files in 3D PDF embedding the 3D models and/or 3D images in one of the 3D file formats accepted under this Standard. If the original 3D model cannot be embedded in 3D PDF in its original format, then it is recommended to convert the 3D model to one of the 3D file formats accepted under this Standard, or to embed 2D image(s) of the object, as received from the applicant or converted by the IPO from 3D formats submitted by the applicant.

26. Paper publication should contain a 2D visual representation of an object, as received from the applicant or converted by an IPO from 3D formats submitted by the applicant.

#### RECOMMENDATIONS FOR PARTIAL CLAIMING, PARTIAL DESIGN, PORTION DESIGN

27. It is recommended that appropriate depiction of partial claiming of design, partial design, or portion design should be feasible in a relevant 3D format, and disclaimed features in designs should be readily recognizable and understandable.

28. The depictions of partial claiming of design, partial design, and portion design featured in relevant 3D format should be robustly maintained during processing of applications with 3D models or 3D images, e.g., when publishing the applications.

[End of ST.XX]

[End of Annex and document]